

PACKAGE ID - 000301IBMPC00 PC-BLAS

KWIC TITLE - PC Basic Linear Algebra Subroutines

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LIMITATION CODE -UNL **AUDIENCE CODE** - UNL

COMPLETION DATE - 11/01/1986 **PUBLICATION DATE** - 11/01/1986

DESCRIPTION - PC-BLAS is a highly optimized version of the Basic Linear Algebra Subprograms (BLAS), a standardized set of thirty-eight routines that perform low-level operations on vectors of numbers in single and double-precision real and complex arithmetic. Routines are included to find the index of the largest component of a vector, apply a Givens or modified Givens rotation, multiply a vector by a constant, determine the Euclidean length, perform a dot product, swap and copy vectors, and find the norm of a vector. The BLAS have been carefully written to minimize numerical problems such as loss of precision and underflow and are designed so that the computation is independent of the interface with the calling program. This independence is achieved through judicious use of Assembly language macros. Interfaces are provided for Lahey Fortran 77, Microsoft Fortran 77, and Ryan-McFarland IBM Professional Fortran.

SOURCE CODE INCLUDED? - Yes

MEDIA QUANTITY - NESC Note; Software Abstract; 1 5.25 Diskette

COMPUTER - IBM PC

OPERATING SYSTEMS - DOS 2.1 or later

PROGRAMMING LANGUAGES - Microsoft Assembler V4 (94%) and FORTRAN 77 (6%)

SOFTWARE LIMITATIONS - The number of components in any vector and the spacing or stride between their entries must not exceed 32,767 ($2^{15} - 1$). PC-BLAS will not work with an 80286 CPU operating in 'protected' mode.

SOURCE CODE AVAILABLE (Y/N) - Y

RELATED SOFTWARE - An initial release of PC-BLAS, received from Steve Langer of Lawrence Livermore National Laboratory, was optimized for Microsoft Fortran compiler use. Portable FORTRAN versions of the BLAS are included in LINPACK (ESTSC 178).

OTHER PROG/OPER SYS INFO - Because of the complexity of their specifications and the fact that they do not normally appear in the inner loop of a linear algebra computation, subroutines SROTMG

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OTHER PROG/OPER SYS INFO - (CONT) and DROTMG are provided in FORTRAN.
An auxiliary program, BUST, is included to separate the single large source file distributed into several smaller files.

HARDWARE REQS - PC-BLAS requires an 8087 or 80287 Numeric Data Processor.

TIME REQUIREMENTS - The PC-BLAS routines can be 1.2 to 4 times as fast as their FORTRAN counterparts.

REFERENCES - PC-BLAS, NESC No. 9617, PC-BLAS Flexible Disk Cartridge Description, National Energy Software Center Note 87-18, December 8, 1986\ C. L. Lawson, R. J. Hanson, D. R. Kincaid, and F. T. Krogh, Basic Linear Algebra Subprograms for Fortran Usage, ACM Transactions on Mathematical Software, Vol. 5, No. 3, pp. 308-323, September 1979.

ABSTRACT STATUS - Abstract first distributed December 1986. IBM PC version submitted November 1986.

SUBJECT CLASS CODE - P

KEYWORDS -

COMPUTER PROGRAM DOCUMENTATION
P CODES
ALGEBRA
VECTORS
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FORTRAN

EDB SUBJECT CATEGORIES -
990200

SPONSOR - DOE/DP

PACKAGE TYPE - SCREENED